APPENDIX D

EPA SITE INSPECTION PRIORITIZATION REPORT

SITE INSPECTION PRIORITIZATION REPORT
AND PRESCORE PACKAGE
DELTA SHIPYARD
PHASE III
HOUMA, LOUISIANA
EPA ID NO.: LAD058475419

Prepared for:

U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

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Submitted by:

Roy F. Weston, Inc.
5599 San Felipe, Suite 700
Houston, Texas 77056
(713) 621-1620

Peter M. Rung/Robert B. Beck, P.E.

December 1994

INTRODUCTION

Roy F. Weston, Inc. (WESTON®) is pleased to present this report, which summarizes the results of the file review and PREscore package completed for the Delta Shipyard (DS) site (LAD058475419) in Houma, Terrebonne Parish, Louisiana. WESTON was tasked by the U.S. Environmental Protection Agency Region VI (EPA VI) to review existing file information and gather additional information (Phase III activities) that would more accurately determine a site score for the DS site. This effort is part of the Site Inspection Prioritization (SIP) Work Assignment for various sites in EPA VI. The PREscore package for the site is attached as part of the report.

EPA established the SIP process to help assess known or potential hazardous waste sites, address first those sites that pose the greatest threat to human health and the environment, and standardize the criteria by which sites are evaluated within the Superfund program. Through the SIP, EPA reviews sites that generally have had a complete Site Inspection (SI) performed on them but that have not received a final decision regarding the need for further investigation or remediation. The outcome of the SIP indicates whether the available information for the site meets a minimum standard of evaluation reflecting the requirements of the revised Hazard Ranking System (HRS). The SIP process better enables EPA to determine if a site is likely to receive a score of 28.5 or above under the HRS, potentially making it a candidate for placement on the National Priorities List (NPL). If it is determined that the site will not score above the NPL threshold of 28.5, EPA is in a position to declare that the site evaluation, under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), has been accomplished.

SITE BACKGROUND INFORMATION

The DS site is located in Houma, Terrebonne Parish, Louisiana. The geographic coordinates of the site are approximately latitude 29°34'2" north and longitude 90°42'18" west. A Site Location Map is provided in Attachment 1 as Figure 1, and a Site Area Map is provided in Attachment 1 as Figure 2. The site can be reached by traveling south on Highway 90 into Houma until reaching East Main Street. Travel east on Main Street for approximately 1.8 miles and turn south on Howard Avenue. From Howard Avenue, travel south for approximately 2.2 miles until reaching Industrial Boulevard. Turn east and travel 0.5 mile. The site is on the south side of Industrial Boulevard.

WESTON contacted Lynn Dean of Elevated Boats Incorporated (EBI) (8404 Colonel Drive, Shelmett, Louisiana 70043), the present owner of the site, in May 1994. Kenneth Serigne, Department Manager for the EBI property, signed an EPA Access Agreement on 15 June 1994, allowing WESTON access to the DS site. Mr. Dean was reached at (504) 278-4200. Mr. Serigne was reached at (504) 868-9655. WESTON met with Mr. Serigne during the site reconnaissance and site sampling mission.

WESTON completed the SIP site reconnaissance on 12 July 1994. The 40-acre site is part of a large industrial park covering approximately 165 acres in southeastern Houma, Louisiana. The industrial park occupies land between a boat slip and Bayou La Carpe. Bayou La Carpe provides access to the Gulf of Mexico through the Houma Intercoastal Waterway. EBI purchased 110 acres of the park in 1985 and currently leases part of it to other industries. The site is surrounded by Gemoco to the north, Christie Industries to the southeast, and Offshore Diving, Salvaging, and Blasting Company to the west. EBI maintains an active fabrication plant/office building on-site.

DS owned the site prior to EBI; the year operations began at the site is unknown. DS consisted of a barge gas-freeing operation and a cleaning and repairing facility for small cargo vessels, fishing vessels, and oil barges. The gas-freeing operation was required because the vessels had to be certified vapor free by the U.S. Coast Guard before repair work could commence. As part of the gas-freeing process, the vessels were steam-cleaned and the oily wastes were removed. The generated oils and wastewater were sent through a separation process after which the waste oil was recovered and sold. Wastes were stored in surface impoundments on-site. Two small waste pits, located approximately 100 feet east of the fabrication building, were sampled and closed in 1984 under the supervision of the Louisiana Department of Environment Quality (LDEQ) Hazardous Waste Division. Two monitoring wells are reportedly located around the closed pits; however, during the site reconnaissance, only one could be located. The pits were reportedly used to dispose of waste oil and oil field drilling material. A Site Plan Map is provided in Attachment 1 as Figure 3.

The DS site contains old gas-stripping equipment (i.e., storage tanks, separator, boiler) left behind from the former operation. The two closed waste oil surface impoundments are now a parking lot used by EBI employees. Four larger pits are located approximately 800 feet south of the fabrication building and are surrounded by dense vegetation. One pit is located west and the other three are located east of Plant Shell Road. According to a Wink Engineering sampling report in 1985, the pit west of the road is actually three pits in series that have been covered over with fill material. For the purposes of this Phase III report, these pits are considered one single pit. The three pits east of the road are exposed and covered with a crusty black substance. At the time of the site reconnaissance, rainwater containing an oily sheen was pooled on the surface of the pits.

The groundwater, soil, and surface water migration pathways are of concern at the site because of possible hazardous constituents being released to these pathways.

Previous investigations at the DS site include the following:

- A Site Inspection (SI) by Ecology & Environment, Inc. on 11 March 1981.
- A SI by The Earth Technology Corporation on 12 September 1984.
- A sampling report by Wink Engineering in July 1985.

Phase III DATA

Additional site information resulting from Phase III SIP efforts (information/data gathering/site reconnaissance/sampling mission) is described below.

Identification and Location of Groundwater Wells

WESTON used file information from EPA VI and contacted the Louisiana Department of Transportation (LDOT) for information on water wells within a 1-mile radius of the site. LDOT files indicate several monitoring wells and 1 rig supply well are located within a 1-mile radius of the site. The rig supply well is plugged and abandoned. The closest wells are three monitoring wells located 2,000 feet to the northeast of the site. They are owned by Torch Energy and are completed in the Mississippi River Alluvial Aquifer Confining Unit. They were drilled in 1990 and range from 7 to 10 feet deep. A Water Well Location Map is provided in Attachment 1 as Figure 4.

Determination of Surface Water Intakes Within the Target Distance Limit

WESTON contacted Bryan Sampey, Plant Manager at the Houma District 3 Water Plant, to determine surface water intakes within the 15-mile stream-flow Target Distance Limit (TDL). The plant is located near the confluence of the Houma Navigational Canal and Bayou Black. Mr. Sampey stated that the Houma plant takes its water from the Houma Navigational Canal. The canal is tidally influenced and saltwater intrusion is a problem. The plant uses Bayou Black as a secondary source of water when saltwater intrusion occurs in the canal. According to Mr. Sampey, the plant serves an estimated 30,000 people. The plant lies 2.55 stream miles upstream of the PPE; however, the canal is tidally influenced and therefore contaminants from the DS site could possibly migrate towards the water plant.

Identification and Location of Wetlands and Sensitive Environments

Surface water runoff draining from the site flows into Bayou La Carpe. Bayou La Carpe enters the Houma Navigational Canal just south of the site. According to the Houma, Louisiana, 7.5-minute wetlands map, the Houma Navigational Canal is bordered by extensive wetland areas. A Surface Water Pathway Map is provided in Attachment 1 as Figure 5.

Site Accessibility

Based on the WESTON Phase III site reconnaissance and sampling mission, the site is fairly accessible to the general public by both vehicle and foot. However, the site is located in an industrial park and the land has little or no recreational value.

Determination of Population by Distance Rings

During the Phase III effort, WESTON determined the population within target distances using the Geographical Exposure Modeling System (GEMS) Database. According to GEMS, 15

people live within the 0.25- to 0.5-mile radius, 3,578 people live within the 0.5- to 1-mile radius, and 36,895 live within the 1- to 4-mile radius of the site.

Identification of Fisheries

WESTON contacted Gerald Adkins of the Louisiana Department of Wildlife and Fisheries (LDWF) to determine if fisheries existed within the 15-mile TDL. Bayou La Carpe and the Houma Navigational Canal are considered limited fisheries because of problems with saltwater intrusion and marine traffic. Adkins stated that at certain times of the year, some freshwater catfish and crab fishing takes place.

Sampling Information

In general accordance with the objectives of the SIP, WESTON implemented a sampling strategy primarily aimed at documenting the presence of hazardous substances at the DS site. WESTON collected soil and sediment samples at the site on 22 August 1994. WESTON completed the sampling activities in general accordance with the site-specific Task Work Plan and Health and Safety Plan. All samples collected during the SIP were shipped to EPA-designated laboratories by Federal Express Priority Overnight Service. Samples requiring organic analyses were sent to Keystone Lab, Houston, Texas, and samples requiring inorganic analyses were sent to Silver Valley Labs, Inc., Kellog, Indiana. CLP data package excerpts are provided in Attachment 4. The sampling activities and analytical results associated with the waste source characterization are summarized in this section of the report.

WESTON collected seven sediment samples (SED-1 through SED-7) and three soil samples (SS-1 through SS-3) in an effort to document the presence and migration of hazardous substances associated with the potential hazardous waste source areas (HWSAs) at the site. Sample locations are shown in Attachment 1 as Figure 6. SIP soil/sediment sample locations, descriptions, and rationales are summarized in Attachment 3 as Table 1.

The soil and sediment samples were analyzed for the following parameters:

- Volatile organic compounds (VOCs),
- Base, neutral, and acid extractable compounds (BNAs),
- Pesticide and polychlorinated biphenyls (PCBs), and
- Inorganic constituents and cyanide.

HRS SCORING

Preliminary PAscore

Using the data provided by EPA VI from Resource Conservation and Recovery Act (RCRA) and CERCLA files, WESTON developed a preliminary HRS score for the site using PAscore

(Version 2.0). The site received a PAscore of significant value to warrant evaluation of the site using PREscore. PREscore was used to develop and document the HRS score for the site in more detail.

PREscore

Factors that had the greatest influence on the Phase III PREscore evaluation are identified in the following sections. Conclusions concerning the site HRS score are presented following the discussion of factors affecting the PREscore. The Phase III PREscore package for the site is provided as Attachment 2.

WASTE SOURCE CHARACTERISTICS

The laboratory analytical results for soil samples SS-2 and SS-3 and sediment samples SED-1, SED-2, and SED-3 were collected from the pits during the SIP and can be used to characterize the potential HWSAs.

Four waste source areas were identified in the file review and site reconnaissance. They consist of four pits used to store waste oils from the DS ship cleaning and repair operation. Pit 4 is actually three pits according to a Wink Engineering report; however, the pits are aligned in series, covered over, and vegetated. For purposes of the Phase III report, they are designated together as Pit 4. The other three pits (1, 2, and 3) are exposed and covered by a black crusty substance. Pits 1, 2, and 3 are elevated and surrounded by a 3- to 6-foot berm. The four pits together have an approximated surface area of 294,000 square feet. The waste characteristics of the site were assessed for the groundwater, soil, and surface water exposure pathways.

Samples collected from the pits indicate the presence of volatiles, semivolatile organics, pesticides, and metals. Sediment analytical results reported at concentrations exceeding three times background concentrations are summarized in Attachment 3, Tables 2 and 3. Soil analytical results reported at concentrations three times background concentrations are summarized in Attachment 3, Table 4. The CLP data summary package is provided as Attachment 4 and photodocumentation is provided as Attachment 5.

Groundwater Pathway

WESTON did not collect any groundwater samples as part of this effort. As part of the monitoring well installation in 1984, soil borings were drilled at the site. The borings indicated low permeability silty clays to 50 feet below grade. No groundwater uses, domestic or industrial, were documented within a 1-mile radius of the site. The factors that most influenced the groundwater pathway Phase III score are as follows:

- LDOT information stating that there is no groundwater use within 1 mile of the site.

- The lack of analytical data to determine a release of hazardous wastes to groundwater in the vicinity of the site.

- The low permeability of the clay soils at the site.

Surface Water Pathway

The laboratory analytical results for sediment samples SED-4 through SED-7 collected during the SIP can be used to characterize the potential for contaminant migration in the surface water pathway. A drainage ditch runs along the west and south ends of Pits 1 through 3. An overflow pipe on Pit 2 drains rainwater from the pit into the ditch. Surface water draining from the pits follows the ditch approximately 0.3 mile until reaching the probable point of entry (PPE) at Bayou La Carpe. Bayou La Carpe flows approximately 4,000 feet south until reaching the Houma Navigational Canal. The Houma Navigational Canal is tidally influenced. Due to the tidal influence, two TDLs are assigned to the site, TDL-1 and TDL-2. TDL-1 is located approximately 2.55 miles upstream of the PPE at the water plant, the farthest point where saltwater intrusion has been documented. TDL-2 is located 15 miles downstream in the Houma Navigational Canal.

The Houma Water Plant is located at the confluence of Bayou Black and the Houma Navigational Canal, approximately 2.55 miles upstream of the site. Bryan Sampey, plant manager of the Houma Water Plant, stated that when saltwater intrusion becomes a problem at the surface water intake, the plant switches to Bayou Black for a water supply. The saltwater encroachment is typically seasonal. The plant reportedly serves 30,000 residents in the surrounding area. According to Gerald Adkins of LDWF, Bayou La Carpe and the Houma Navigational Canal are considered limited fisheries because of saltwater intrusion and marine traffic.

Sediment samples collected from the drainage ditch surrounding Pits 1 through 3 indicate the presence of several semivolatile organics and metals. Sediment analytical results reported at concentrations exceeding three times background concentrations are summarized in Attachment 3, Tables 2 and 3. A Surface Water Pathway Map is provided in Attachment 1 as Figure 5.

Soil Exposure Pathway

The site is situated near a residential area and is accessible to the public; however, there are no residences within 200 feet of on-site contamination. The site serves as an industrial park and has little or no recreational value. EBI maintains 20 workers on-site. The residents of Houma living within 1 mile of the site were scored as nearby individuals. The most important factors considered for the soil exposure pathway are as follows:

- The pits are accessible and there is a residential population within the nearby vicinity. However, no recreational activities were documented on-site.

- Several on-site workers are present in the industrial park.

Air Pathway

The air pathway was not evaluated as part of the Phase III effort due to lack of data; however, during the SIP quantitative air monitoring, no readings were measured at levels above background concentrations in the breathing space around the pits. Readings taken near the surface of the pits did exceed background concentrations.

Data Gaps

WESTON identified several data gaps during the file review and PREscore evaluation. Some of these data gaps were filled (as directed by EPA VI) during Phase III data collection; however, additional data gaps remain and may significantly affect the site score. The most critical remaining data gaps include the following:

- Additional analytical data to indicate if hazardous materials present at the site are releasing to Bayou La Carpe and the Houma Navigational Canal.
- Additional analytical data to determine if hazardous materials are affecting the Houma Water Plant.
- Additional investigation of the sensitive environments associated with the surface water pathway and an accurate delineation of the upstream TDL.

CONCLUSIONS

The DS site is an inactive barge cleaning, repairing, and gas-freeing operation located on the southern side of Houma, in Terrebonne Parish, Louisiana. The DS site operated as a barge cleaning, repairing, and gas-freeing facility for an undetermined period of time prior to 1986 when EBI bought the site.

Concerns associated with the migration of hazardous constituents from the site and exposure pathways are summarized as follows:

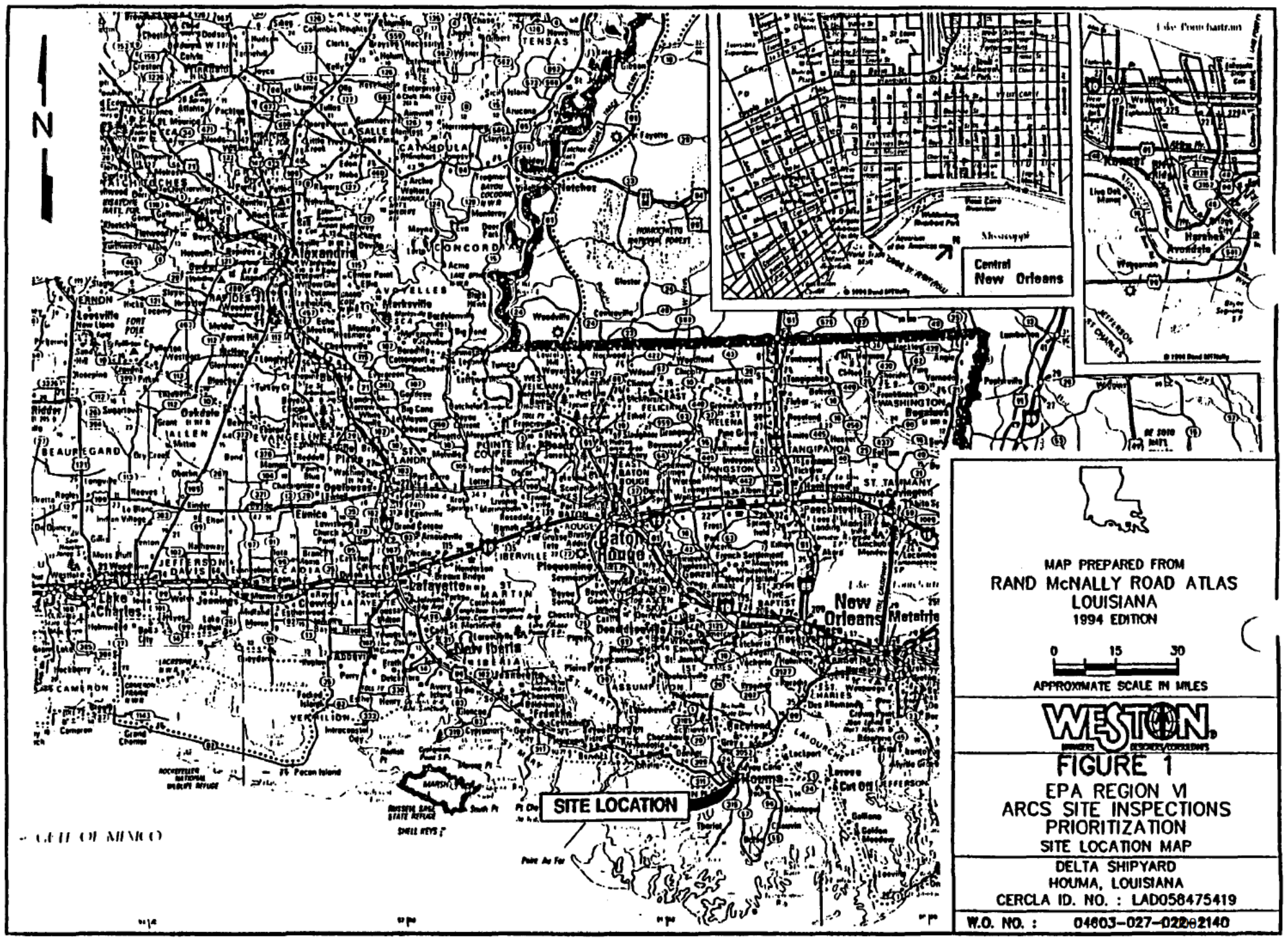
- Based on the information presented in the Groundwater Pathway section, a release of hazardous constituents to groundwater is of little concern. A release to groundwater has not been documented, the subsurface soils are relatively impermeable, and no groundwater use has been identified in the vicinity of the site.
- Based on the information presented in the Surface Water Pathway section, a release of hazardous constituents to surface water is of concern. Several hazardous constituents were detected in the drainage ditch leading to Bayou La Carpe. The Houma Water Plant surface water intake and several miles of wetlands frontage are located within the TDL.

- Based on the information presented in the Soil Exposure Pathway section, a release of hazardous constituents is of concern because several semivolatile organics, pesticides, and heavy metals have been detected in the on-site pits at levels significantly above background concentrations. Soil exposure targets include the on-site workers and the nearby population.

- Based on the information presented in the Air Pathway section, the air pathway is of no concern because the barge cleaning, repairing, and gas-freeing facility is no longer active.

The individual pathways with the greatest influence on the HRS score were surface water and soil exposure pathways.

ATTACHMENT 1



MAP PREPARED FROM
RAND McNALLY ROAD ATLAS
LOUISIANA
1994 EDITION

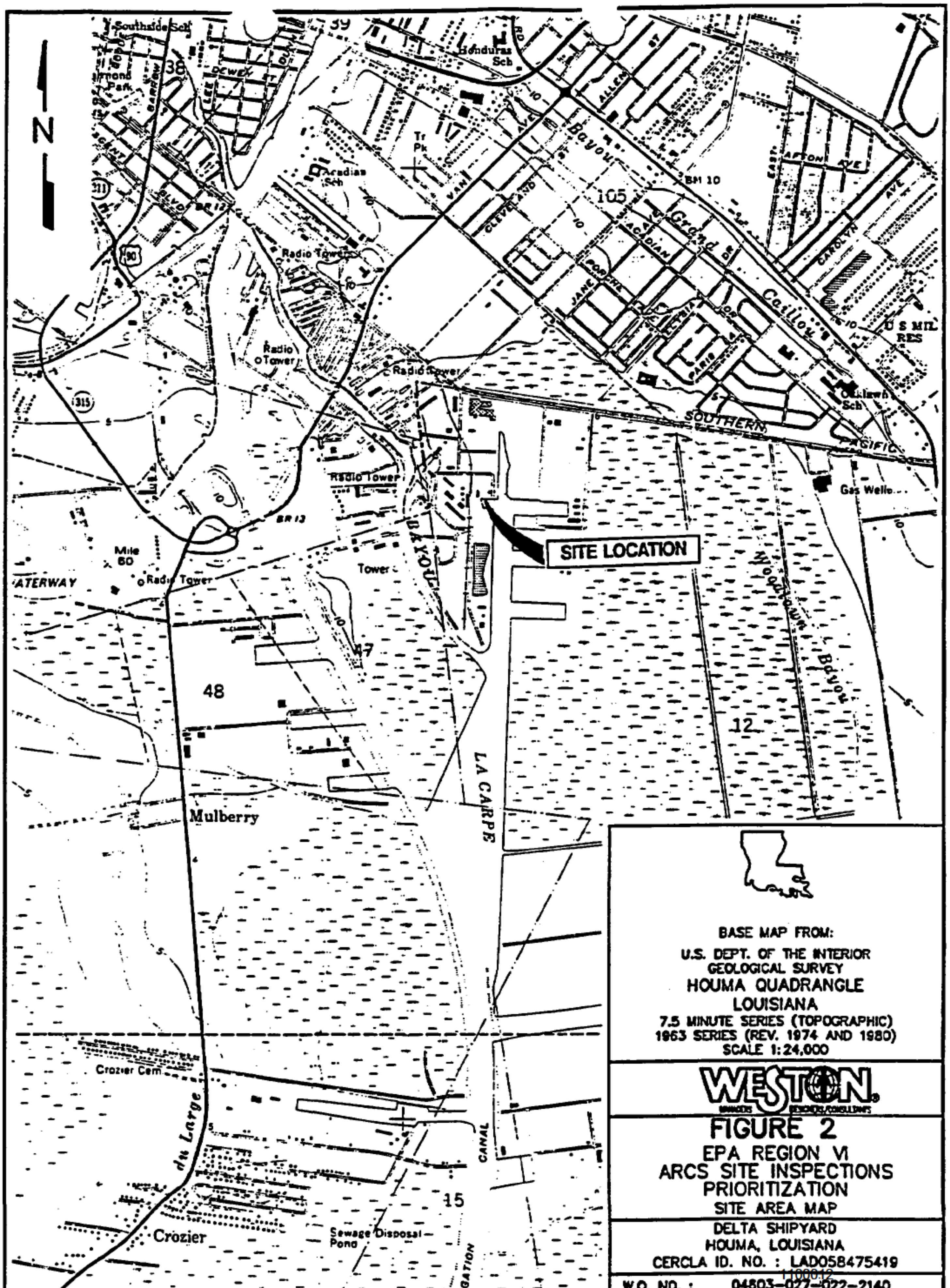
0 15 30
APPROXIMATE SCALE IN MILES

WESTON
MANAGERS OF ENVIRONMENTAL RESOURCES/CORRIDORS

FIGURE 1
EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
SITE LOCATION MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-027-0220-2140



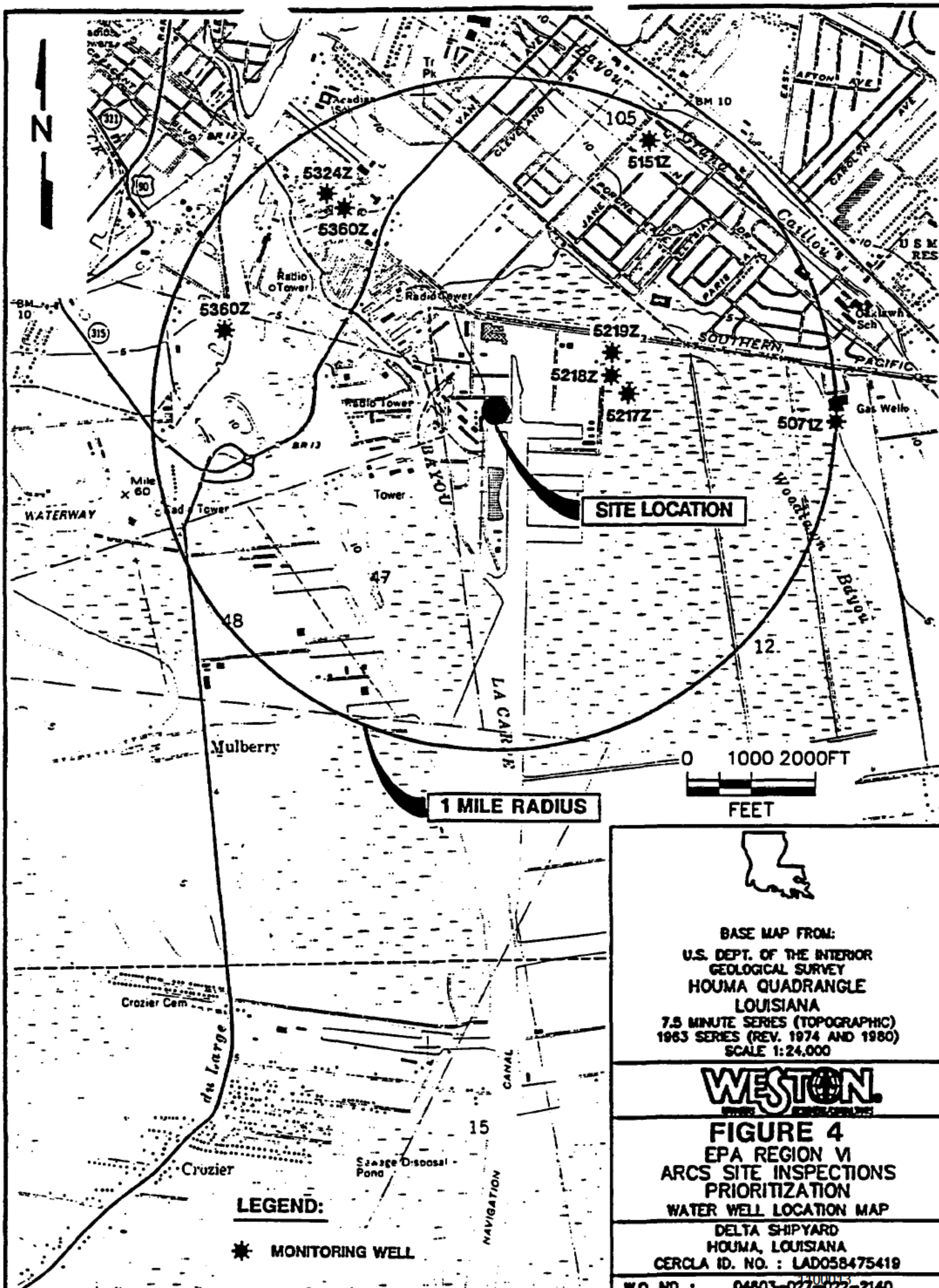
BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
HOUMA QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1963 SERIES (REV. 1974 AND 1980)
SCALE 1:24,000

WESTON

FIGURE 2
EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
SITE AREA MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04803-027-022-2140



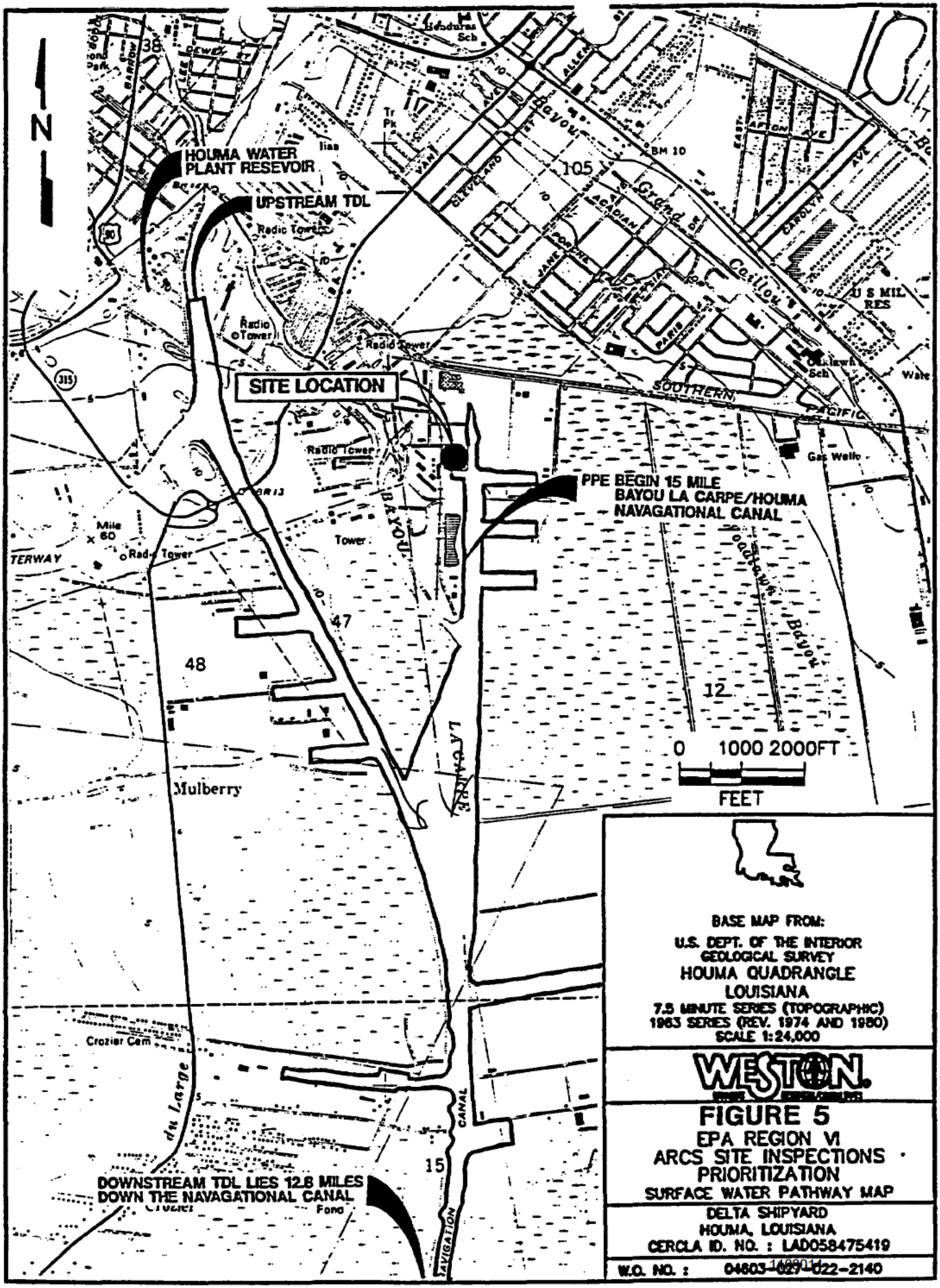
BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
HOUMA QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1963 SERIES (REV. 1974 AND 1980)
SCALE 1:24,000

WESTON

FIGURE 4
EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
WATER WELL LOCATION MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-027-022-2140



BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
HOUMA QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1963 SERIES (REV. 1974 AND 1980)
SCALE 1:24,000

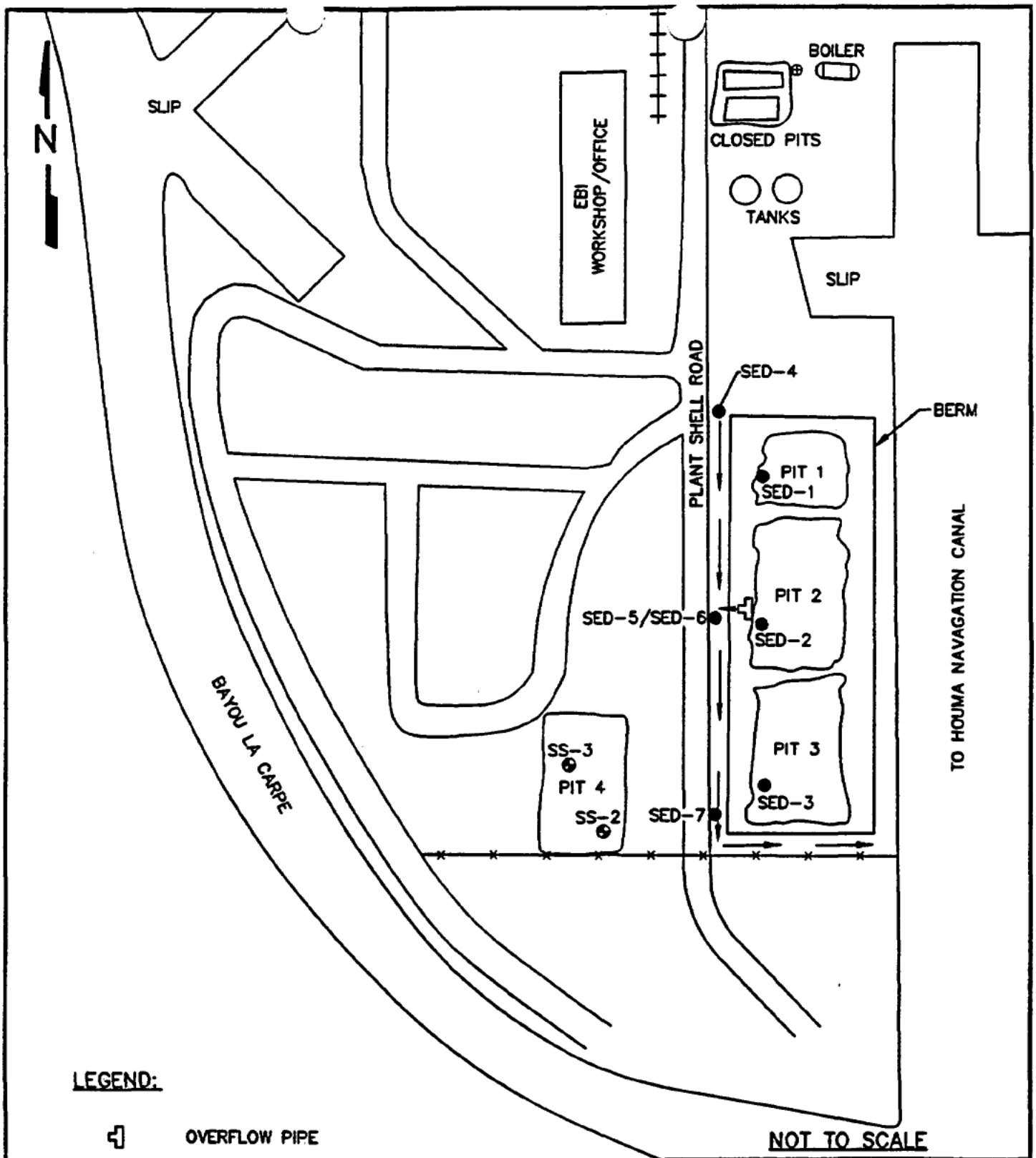
WESTON

FIGURE 5

EPA REGION VI
ARCS SITE INSPECTIONS PRIORITIZATION
SURFACE WATER PATHWAY MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04803-029-022-2140



LEGEND:

- OVERFLOW PIPE
- FENCE
- DRAINAGE DITCH
- SEDIMENT SAMPLE
- SOIL SAMPLE

NOTE

SS-1 IS TAKEN OFFSITE AS A BACKGROUND SAMPLE.

NOT TO SCALE

WESTON

FIGURE 6

EPA REGION VI
ARCS SITE INSPECTIONS
PRIORITIZATION
SAMPLE LOCATION MAP

DELTA SHIPYARD
HOUMA, LOUISIANA
CERCLA ID. NO. : LAD058475419

W.O. NO. : 04603-027-022-2140

PCP-1: \ARCS\ARC2722\ARCS

I: \ARCS\ARC2722\2140.PA.RF 11-28-94 1=1

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
1,1,1-Trichloroethane	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
1,1,2,2-Tetrachloroethane	ND	----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
1,1,2-Trichloroethane	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
1,1-Dichloroethane	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,1-Dichloroethene	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,2-Dichloroethane	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,2-Dichloroethene (total)	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
1,2-Dichloropropane	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
2-Butanone	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
2-Hexanone	ND	----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
4-Methyl-2-pentanone	ND	----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
Acetone	ND	----	13 UJ	160 UJ	21 U	21 U	18 U	18 UJ
Benzene	ND	----	13 UJ	73	21 UJ	21 U	18 UJ	18 UJ
Bromodichloromethane	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Bromoform	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Bromomethane	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Carbon disulfide	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Carbon tetrachloride	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Chlorobenzene	ND	----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
Chloroethane	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Chloroform	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Chloromethane	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
cis-1,3-Dichloropropene	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Dibromochloromethane	ND	----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Ethylbenzene	ND	----	13 UJ	170	21 UJ	21 UJ	18 UJ	18 UJ
Methylene Chloride	ND	----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Styrene	ND	----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ
Tetrachloroethene	ND	----	13 UJ	68 U	21 UJ	21 UJ	18 UJ	18 UJ

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100016

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Sediment Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Toluene	5	15	13 UJ	43 J C-BSQL	21 UJ	5 Jv	18 UJ	18 UJ
trans-1,3-Dichloropropene	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Trichloroethene	ND	-----	13 UJ	68 U	21 UJ	21 U	18 UJ	18 UJ
Vinyl Chloride	ND	-----	13 UJ	68 U	21 U	21 U	18 U	18 UJ
Xylenes (total)	ND	-----	13 UJ	240	21 UJ	21 UJ	18 UJ	18 UJ

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
1,2,4-Trichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
1,2-Dichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
1,3-Dichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
1,4-Dichlorobenzene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,2'-Oxybis(1-chloropropane)	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4,5-Trichlorophenol	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
2,4,6-Trichlorophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4-Dichlorophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4-Dimethylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2,4-Dinitrophenol	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
2-Chloronaphthalene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2-Chlorophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2-Methylnaphthalene	69	207	430 U	47000	700 U	690 U	580 U	580 U
2-Methylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
2-Nitroaniline	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
2-Nitrophenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
3,3'-Dichlorobenzidine	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
3-Nitroaniline	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
4,6-Dinitro-2-methylphenol	ND	-----	1000 UR	11000 U	1700 U	1700 U	1400 U	1400 U
4-Bromophenyl-phenylether	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
4-Chloro-3-methylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Chloroaniline	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Chlorophenyl-phenylether	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Methylphenol	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
4-Nitroaniline	ND	-----	1000 U	11000 U	1700 U	1700 U	1400 U	1400 U
4-Nitrophenol	ND	-----	1000 UR	11000 U	1700 U	1700 U	1400 U	1400 U
Acenaphthene	ND	-----	430 U	1800 J C-BSQL	700 U	470 J C-BSQL	580 U	34 J C-BSQL
Acenaphthylene	ND	-----	430 U	550 J C-BSQL	700 U	89 J C-BSQL	60 J C-BSQL	46 J C-BSQL

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100018

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Sediment Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Anthracene	ND	-----	430 UR	540 J C-BSQL	700 U	1300 J	83 J C-BSQL	82 J C-BSQL
Benzo(a)anthracene	ND	-----	430 UJ	440 J C-BSQL	700 U	6000 J	580 J	310 J C-BSQL
Benzo(a)pyrene	ND	-----	430 UJ	210 J C-BSQL	700 U	4100 J	390 J C-BSQL	190 J C-BSQL
Benzo(b)fluoranthene	ND	-----	300 Jv	450 J C-BSQL	700 U	6100 J	840 J	410 J C-BSQL
Benzo(g,h,i)perylene	ND	-----	430 UJ	4500 U	700 U	2500 J	430 J C-BSQL	290 J C-BSQL
Benzo(k)fluoranthene	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
bis(2-Chloroethoxy)methane	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
bis(2-Chloroethyl)ether	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
bis(2-Ethylhexyl)phthalate	ND	-----	430 UJ	4500 U	700 U	190 J C-BSQL	120 J C-BSQL	580 U
Butylbenzylphthalate	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
Carbazole	ND	-----	430 UR	4500 U	700 U	690	580 U	87 J C-BSQL
Chrysene	ND	-----	1200 Jv	460 J C-BSQL	700 U	5300 J	710 J	270 J C-BSQL
Di-n-butylphthalate	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
Di-n-octylphthalate	ND	-----	430 UJ	4500 U	700 U	690 U	580 U	580 U
Dibenz(a,h)anthracene	ND	-----	430 UJ	4500 U	700 U	1300 J	180 J C-BSQL	580 U
Dibenzofuran	ND	-----	430 U	1300 J C-BSQL	700 U	120 J C-BSQL	580 U	580 U
Diethylphthalate	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Dimethylphthalate	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Fluoranthene	ND	-----	430 UR	4500 U	700 U	13000 J	1000 J	530 J C-BSQL
Fluorene	ND	-----	430 U	5100	700 U	310 J C-BSQL	580 U	40 J C-BSQL
Hexachlorobenzene	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
Hexachlorobutadiene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Hexachlorocyclopentadiene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Hexachloroethane	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
Indeno(1,2,3-cd)pyrene	ND	-----	430 UJ	4500 U	700 U	3000 J	390 J C-BSQL	210 J C-BSQL
Isophorone	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
N-Nitroso-di-n-propylamine	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U
N-Nitrosodiphenylamine	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U

1100019

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Sediment Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Naphthalene	ND	----	430 U	11000	700 U	690 U	580 U	580 U
Nitrobenzene	ND	----	430 U	4500 U	700 U	690 U	580 U	580 U
Pentachlorophenol	ND	----	1000 UR	11000 U	1700 U	1700 U	1400 U	1400 U
Phenanthrene	ND	----	430 UR	8800	700 U	5000 J	310 J C-BSQL	440 J C-BS
Phenol	ND	----	430 U	4500 U	700 U	690 U	580 U	580 U
Pyrene	ND	----	430 UJ	740 J C-BSQL	700 U	12000 J	570 J C-BSQL	390 J C-BSQL

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100020

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
4,4'-DDD	ND	-----	35	4.5 U	7 U	6.9 U	5.8 U	5.8 U
4,4'-DDE	ND	-----	4.3 U	4.5 U	7 UJ	6.9 U	5.8 U	5.8 U
4,4'-DDT	ND	-----	4.3 UR	4.5 U	7 U	6.9 U	5.8 U	5.8 U
Aldrin	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	3 U	3 U
alpha-BHC	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	3 U	3 U
alpha-Chlordane	ND	-----	2.2 U	4.5 U	3.6 UJ	3.5 U	3 U	0.32 J C-BSQL
beta-BHC	7.4	22.2	12 JT	2.3 U	1.1 Jv	3.5 U	3 U	3 U
delta-BHC	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	0.26 J C-BSQL	3 U
Dieldrin	ND	-----	4.3 U	4.5 U	7 UJ	6.9 U	5.8 U	5.8 U
Endosulfan I	ND	-----	2.2 U	2.3 U	3.6 U	3.5 U	3 U	3 U
Endosulfan II	ND	-----	4.3 U	4.5 U	7 U	6.9 U	5.8 U	5.8 U
Endosulfan sulfate	ND	-----	4.3 U	4.5 U	7 U	6.9 U	5.8 U	5.8 U
Endrin	ND	-----	4.3 U	4.5 U	7 UJ	6.9 U	5.8 U	5.8 U
Endrin aldehyde	ND	-----	4.3 U	13 JT C-NA	7 U	6.9 U	5.8 U	5.8 U
Endrin ketone	ND	-----	7.1 JT C-NA	1 J C-BSQL	7 U	6.9 U	5.8 U	5.8 U
gamma-BHC (lindane)	ND	-----	2.2 U	2.3 U	3.6 UJ	3.5 U	3 U	3 U
gamma-Chlordane	1.1	3.3	2.2 U	9.8 JT C-NA	3.6 UJ	0.39 J	0.26 J	0.26 J
Heptachlor	ND	-----	2.2 U	1.5 J C-BSQL	0.17 Jv C-BSQL	3.5 U	3 U	3 U
Heptachlor epoxide	1.3	3.9	25 J C-UB	3.7 J	2.3 Jv	3.5 U	3 U	3 U
Methoxychlor	ND	-----	69 J	23 U	3.7 J C-BSQL	35 U	30 U	30 U
Toxaphene	ND	-----	220 UJ	230 U	360 U	350 U	300 U	300 U

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100021

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
Aroclor-1016	ND	----	43 U	45 U	70 U	69 U	58 U	58 U
Aroclor-1221	ND	----	88 U	92 UJ	140 U	140 U	120 U	120 U
Aroclor-1232	ND	----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1242	ND	----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1248	ND	----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1254	ND	----	43 UJ	45 U	70 U	69 U	58 U	58 U
Aroclor-1260	ND	----	43 UJ	45 U	70 U	69 U	58 U	58 U

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100022

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 MFDP04 08/22/94	SED002 SED002 MFDP05 08/22/94	SED003 SED003 MFDP06 08/22/94	SED005 SED005 MFDP08 08/22/94	SED005 SED006 MFDP09 08/22/94	SED007 SED007 MFDP10 08/22/94
ALUMINUM	3400	10200	6430	6830	6160	9090	6890	10900
ANTIMONY	ND	-----	10.5 J	7.5 J	9.7 UJ	10.9 UJ	12.5 J	12 UJ
ARSENIC	4.9	14.7	22.1 Jv	6.3 Jv	4.2 Jv	24.8 Jv	16.3 Jv	23.1 Jv
BARIUM	5540	16620	11900	15100	18000	20100	17300	20500
BERYLLIUM	0.29	0.87	0.53	0.49	0.39	0.79	0.75	0.94
CADMIUM	ND	-----	4.9	1 U	1.8	1.5 U	1.7	1.6 U
CALCIUM	86100	258300	12000	4030	4810	9420	14200	16400
CHROMIUM	58.3	174.9	527	54.4	35.2	27.8	39.1	42.8
COBALT	5	15	9.7	11.4	8.8 Jv	13.5	10.5 Jv	16.8 C-NA
COPPER	66.8	200.4	75.2 J	48.4 J	33.6 J	61.3 J	55.2 J	45.8 J
CYANIDE	ND	-----	0.67 U	0.65 U	0.85 U	0.95 U	0.88 U	1.1 U
IRON	23200	69600	21500	43200	10200	19800	16400	21400
LEAD	92	276	632	185	158	181	195	125
MAGNESIUM	5300	15900	2850	2100	2470	3740	3270	4610
MANGANESE	245	735	480	231	120	280	305	509
MERCURY	ND	-----	1.3 J	0.22 J	0.23 J	0.29 J	0.3 J	0.21 UJ
NICKEL	9.4	28.2	18.9	25.2	12.9	24.4	19.4	28.4 C-NA
POTASSIUM	703	2109	1570	1270	1140	1760	1420	1610
SELENIUM	ND	-----	0.37	0.18 U	0.31	0.27 U	0.25 U	0.29 U
SILVER	1.4	4.2	4.1	3.3	1.3	2.2	3.5	3.3
SODIUM	241	723	331	180	181	289	253	360
THALLIUM	0.5	1.5	0.61	0.4	0.41	0.76	0.47	0.62
VANADIUM	9	27	24.4	18.7	14.9	25.4	19.5	30.1
ZINC	805	2415	835	302	149	449	444	245

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100023

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Characterization Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED001 SED001 FDB32 08/22/94	SED002 SED002 FDB33 08/22/94	SED003 SED003 FDB35 08/22/94	SED005 SED005 FDB38 08/22/94	SED005 SED006 FDB39 08/22/94	SED007 SED007 FDB41 08/22/94
2,4-Dinitrotoluene	ND	-----	430 UR	4500 U	700 U	690 U	580 U	580 U
2,6-Dinitrotoluene	ND	-----	430 U	4500 U	700 U	690 U	580 U	580 U

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,1,1-Trichloroethane	ND	-----	15 UJ					
1,1,2,2-Tetrachloroethane	ND	-----	15 UJ					
1,1,2-Trichloroethane	ND	-----	15 UJ					
1,1-Dichloroethane	ND	-----	15 UJ					
1,1-Dichloroethene	ND	-----	15 UJ					
1,2-Dichloroethane	ND	-----	15 UJ					
1,2-Dichloroethene (total)	ND	-----	15 UJ					
1,2-Dichloropropane	ND	-----	15 UJ					
2-Butanone	ND	-----	15 UJ					
2-Hexanone	ND	-----	15 UJ					
4-Methyl-2-pentanone	ND	-----	15 UJ					
Acetone	ND	-----	15 UJ					
Benzene	ND	-----	15 UJ					
Bromodichloromethane	ND	-----	15 UJ					
Bromoform	ND	-----	15 UJ					
Bromomethane	ND	-----	15 UJ					
Carbon disulfide	ND	-----	15 UJ					
Carbon tetrachloride	ND	-----	15 UJ					
Chlorobenzene	ND	-----	15 UJ					
Chloroethane	ND	-----	15 UJ					
Chloroform	ND	-----	15 UJ					
Chloromethane	ND	-----	15 UJ					
cis-1,3-Dichloropropene	ND	-----	15 UJ					
Dibromochloromethane	ND	-----	15 UJ					
Ethylbenzene	ND	-----	15 UJ					
Methylene Chloride	ND	-----	15 UJ					
Styrene	ND	-----	15 UJ					
Tetrachloroethene	ND	-----	15 UJ					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100025

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Sediment Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Toluene	5	15	5 Jv					
trans-1,3-Dichloropropene	ND	-----	15 UJ					
Trichloroethene	ND	-----	15 UJ					
Vinyl Chloride	ND	-----	15 UJ					
Xylenes (total)	ND	-----	15 UJ					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
4,4'-DDD	ND	-----	5.1 U					
4,4'-DDE	ND	-----	5.1 U					
4,4'-DDT	ND	-----	5.1 U					
Aldrin	ND	-----	2.6 U					
alpha-BHC	ND	-----	2.6 U					
alpha-Chlordane	ND	-----	2.6 U					
beta-BHC	7.4	22.2	7.4 T					
delta-BHC	ND	-----	2.6 U					
Dieldrin	ND	-----	5.1 U					
Endosulfan I	ND	-----	2.6 U					
Endosulfan II	ND	-----	5.1 U					
Endosulfan sulfate	ND	-----	5.1 U					
Endrin	ND	-----	5.1 U					
Endrin aldehyde	ND	-----	5.1 U					
Endrin ketone	ND	-----	5.1 U					
gamma-BHC (lindane)	ND	-----	2.6 U					
gamma-Chlordane	1.1	3.3	1.1 J					
Heptachlor	ND	-----	2.6 U					
Heptachlor epoxide	1.3	3.9	1.3 J					
Methoxychlor	ND	-----	26 U					
Toxaphene	ND	-----	260 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100027

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Aroclor-1016	ND	-----	51 U					
Aroclor-1221	ND	-----	100 U					
Aroclor-1232	ND	-----	51 U					
Aroclor-1242	ND	-----	51 U					
Aroclor-1248	ND	-----	51 U					
Aroclor-1254	ND	-----	51 U					
Aroclor-1260	ND	-----	51 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,2,4-Trichlorobenzene	ND	-----	510 U					
1,2-Dichlorobenzene	ND	-----	510 U					
1,3-Dichlorobenzene	ND	-----	510 U					
1,4-Dichlorobenzene	ND	-----	510 U					
2,2'-Oxybis(1-chloropropane)	ND	-----	510 U					
2,4,5-Trichlorophenol	ND	-----	1200 U					
2,4,6-Trichlorophenol	ND	-----	510 U					
2,4-Dichlorophenol	ND	-----	510 U					
2,4-Dimethylphenol	ND	-----	510 U					
2,4-Dinitrophenol	ND	-----	1200 U					
2-Chloronaphthalene	ND	-----	510 U					
2-Chlorophenol	ND	-----	510 U					
2-Methylnaphthalene	69	207	69 J					
2-Methylphenol	ND	-----	510 U					
2-Nitroaniline	ND	-----	1200 U					
2-Nitrophenol	ND	-----	510 U					
3,3'-Dichlorobenzidine	ND	-----	510 UJ					
3-Nitroaniline	ND	-----	1200 U					
4,6-Dinitro-2-methylphenol	ND	-----	1200 U					
4-Bromophenyl-phenylether	ND	-----	510 U					
4-Chloro-3-methylphenol	ND	-----	510 U					
4-Chloroaniline	ND	-----	510 U					
4-Chlorophenyl-phenylether	ND	-----	510 U					
4-Methylphenol	ND	-----	510 U					
4-Nitroaniline	ND	-----	1200 U					
4-Nitrophenol	ND	-----	1200 U					
Acenaphthene	ND	-----	510 U					
Acenaphthylene	ND	-----	510 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100029

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Sediment Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Anthracene	ND	-----	510 U					
Benzo(a)anthracene	ND	-----	510 UJ					
Benzo(a)pyrene	ND	-----	510 UJ					
Benzo(b)fluoranthene	ND	-----	510 UJ					
Benzo(g,h,i)perylene	ND	-----	510 UJ					
Benzo(k)fluoranthene	ND	-----	510 UJ					
bis(2-Chloroethoxy)methane	ND	-----	510 U					
bis(2-Chloroethyl)ether	ND	-----	510 U					
bis(2-Ethylhexyl)phthalate	ND	-----	510 UJ					
Butylbenzylphthalate	ND	-----	510 UJ					
Carbazole	ND	-----	510 U					
Chrysene	ND	-----	510 UJ					
Di-n-butylphthalate	ND	-----	510 U					
Di-n-octylphthalate	ND	-----	510 UJ					
Dibenz(a,h)anthracene	ND	-----	510 UJ					
Dibenzofuran	ND	-----	510 U					
Diethylphthalate	ND	-----	510 U					
Dimethylphthalate	ND	-----	510 U					
Fluoranthene	ND	-----	510 U					
Fluorene	ND	-----	510 U					
Hexachlorobenzene	ND	-----	510 U					
Hexachlorobutadiene	ND	-----	510 U					
Hexachlorocyclopentadiene	ND	-----	510 U					
Hexachloroethane	ND	-----	510 U					
Indeno(1,2,3-cd)pyrene	ND	-----	510 UJ					
Isophorone	ND	-----	510 U					
N-Nitroso-di-n-propylamine	ND	-----	510 U					
N-Nitrosodiphenylamine	ND	-----	510 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100030

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Sediment Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Naphthalene	ND	----	510 U					
Nitrobenzene	ND	----	510 U					
Pentachlorophenol	ND	----	1200 U					
Phenanthrene	ND	----	510 U					
Phenol	ND	----	510 U					
Pyrene	ND	----	510 UJ					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100031

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 MFDP07 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
ALUMINUM	3400	10200	3400					
ANTIMONY	ND	-----	7.6 UJ					
ARSENIC	4.9	14.7	4.9 Jv					
BARIUM	5540	16620	5540					
BERYLLIUM	0.29	0.87	0.29					
CADMIUM	ND	-----	1 U					
CALCIUM	86100	258300	86100					
CHROMIUM	58.3	174.9	58.3					
COBALT	5	15	5 Jv					
COPPER	66.8	200.4	66.8 J					
CYANIDE	ND	-----	0.67 U					
IRON	23200	69600	23200					
LEAD	92	276	92					
MAGNESIUM	5300	15900	5300					
MANGANESE	245	735	245					
MERCURY	ND	-----	0.13 UJ					
NICKEL	9.4	28.2	9.4					
POTASSIUM	703	2109	703					
SELENIUM	ND	-----	0.19 UJ					
SILVER	1.4	4.2	1.4					
SODIUM	241	723	241					
THALLIUM	0.5	1.5	0.5 J					
VANADIUM	9	27	9					
ZINC	805	2415	805					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Sediment Background Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SED004 SED004 FDB36 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
2,4-Dinitrotoluene	ND	-----	510 U					
2,6-Dinitrotoluene	ND	-----	510 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100033

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,1,1-Trichloroethane	ND	-----	13 UJ	14 U				
1,1,2,2-Tetrachloroethane	ND	-----	13 UJ	14 U				
1,1,2-Trichloroethane	ND	-----	13 UJ	14 U				
1 chloroethane	ND	-----	13 UJ	14 U				
1,1-Dichloroethene	ND	-----	13 UJ	14 U				
1,2-Dichloroethane	ND	-----	13 UJ	14 U				
1,2-Dichloroethene (total)	ND	-----	13 UJ	14 U				
1,2-Dichloropropane	ND	-----	13 UJ	14 U				
2-Butanone	ND	-----	13 UJ	14 U				
2-Hexanone	ND	-----	13 UJ	14 U				
4-Methyl-2-pentanone	ND	-----	13 UJ	14 U				
Acetone	ND	-----	13 UJ	40 U				
Benzene	ND	-----	13 UJ	14 U				
Bromodichloromethane	ND	-----	13 UJ	14 U				
Bromoform	ND	-----	13 UJ	14 U				
Bromomethane	ND	-----	13 UJ	14 U				
Carbon disulfide	ND	-----	13 UJ	14 U				
n tetrachloride	ND	-----	13 UJ	14 U				
Chlorobenzene	ND	-----	13 UJ	14 U				
Chloroethane	ND	-----	13 UJ	14 U				
Chloroform	ND	-----	13 UJ	14 U				
Chloromethane	ND	-----	13 UJ	14 U				
cis-1,3-Dichloropropene	ND	-----	13 UJ	14 U				
Dibromochloromethane	ND	-----	13 UJ	14 U				
Ethylbenzene	ND	-----	13 UJ	14 U				
Methylene Chloride	ND	-----	13 UJ	14 U				
Styrene	ND	-----	13 UJ	14 U				
Tetrachloroethene	ND	-----	13 UJ	14 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Characterization Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Toluene	ND	----	13 UJ	14 U				
trans-1,3-Dichloropropene	ND	----	13 UJ	14 U				
Trichloroethene	ND	----	13 UJ	14 U				
Vinyl Chloride	ND	----	13 UJ	14 U				
Xylenes (total)	ND	----	13 UJ	14 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,2,4-Trichlorobenzene	ND	-----	440 U	470 U				
1,2-Dichlorobenzene	ND	-----	440 U	470 U				
1,3-Dichlorobenzene	ND	-----	440 U	470 U				
1,4-Dichlorobenzene	ND	-----	440 U	470 U				
2,2'-Oxybis(1-chloropropane)	ND	-----	440 U	470 U				
2,4,5-Trichlorophenol	ND	-----	1100 U	1100 U				
2,4,6-Trichlorophenol	ND	-----	440 U	470 U				
2,4-Dichlorophenol	ND	-----	440 U	470 U				
2,4-Dimethylphenol	ND	-----	440 U	470 U				
2,4-Dinitrophenol	ND	-----	1100 U	1100 U				
2-Chloronaphthalene	ND	-----	440 U	470 U				
2-Chlorophenol	ND	-----	440 U	470 U				
2-Methylnaphthalene	ND	-----	440 U	250 J C-BSQL				
2-Methylphenol	ND	-----	440 U	470 U				
2-Nitroaniline	ND	-----	1100 U	1100 U				
2-Nitrophenol	ND	-----	440 U	470 U				
3,3'-Dichlorobenzidine	ND	-----	440 U	470 U				
3-Nitroaniline	ND	-----	1100 U	1100 U				
4,6-Dinitro-2-methylphenol	ND	-----	1100 U	1100 U				
4-Bromophenyl-phenylether	ND	-----	440 U	470 U				
4-Chloro-3-methylphenol	ND	-----	440 U	470 U				
4-Chloroaniline	ND	-----	440 U	470 U				
4-Chlorophenyl-phenylether	ND	-----	440 U	470 U				
4-Methylphenol	ND	-----	440 U	470 U				
4-Nitroaniline	ND	-----	1100 U	1100 U				
4-Nitrophenol	ND	-----	1100 U	1100 U				
Acenaphthene	ND	-----	440 U	470 U				
Acenaphthylene	ND	-----	440 U	470 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Anthracene	ND	-----	51 J C-BSQL	470 U				
Benzo(a)anthracene	33	99	100 J C-BSQL	95 J				
Benzo(a)pyrene	ND	-----	86 J C-BSQL	470 U				
B (b)fluoranthene	53	159	130 J	85 J				
Benzo(g,h,i)perylene	ND	-----	100 J C-BSQL	470 U				
Benzo(k)fluoranthene	ND	-----	440 U	470 U				
bis(2-Chloroethoxy)methane	ND	-----	440 U	470 U				
bis(2-Chloroethyl)ether	ND	-----	440 U	470 U				
bis(2-Ethylhexyl)phthalate	130	390	71 J	470 U				
Butylbenzylphthalate	ND	-----	440 U	470 U				
Carbazole	ND	-----	440 U	470 U				
Chrysene	83	249	120 J	200 J				
Di-n-butylphthalate	ND	-----	440 U	470 U				
Di-n-octylphthalate	ND	-----	440 U	470 U				
Dibenz(a,h)anthracene	ND	-----	440 U	470 U				
Dibenzofuran	ND	-----	440 U	470 U				
Di thylphthalate	ND	-----	440 U	470 U				
L thylphthalate	ND	-----	440 U	470 U				
Fluoranthene	68	204	210 J C-BSQL	430 J C-BSQL				
Fluorene	ND	-----	440 U	470 U				
Hexachlorobenzene	ND	-----	440 U	470 U				
Hexachlorobutadiene	ND	-----	440 U	470 U				
Hexachlorocyclopentadiene	ND	-----	440 U	470 U				
Hexachloroethane	ND	-----	440 U	470 U				
Indeno(1,2,3-cd)pyrene	ND	-----	84 J C-BSQL	470 U				
Isophorone	ND	-----	440 U	470 U				
N-Nitroso-di-n-propylamine	ND	-----	440 U	470 U				
N-Nitrosodiphenylamine	ND	-----	440 U	470 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Characterization Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Naphthalene	ND	-----	440 U	470 U				
Nitrobenzene	ND	-----	440 U	470 U				
Pentachlorophenol	ND	-----	1100 U	1100 U				
Phenanthrene	32	96	120 J C-BSQL	480 C-BSQL				
Phenol	ND	-----	440 U	470 U				
Pyrene	52	156	130 J	260 J C-BSQL				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
4,4'-DDD	ND	-----	4.4 U	4.7 U				
4,4'-DDE	ND	-----	4.4 U	4.7 U				
4,4'-DDT	ND	-----	4.4 U	4.7 U				
[illegible]	ND	-----	2.3 U	2.4 U				
alpha-BHC	ND	-----	2.3 U	2.4 U				
alpha-Chlordane	0.35	1.05	0.54 J	2.4 U				
beta-BHC	ND	-----	1.1 J C-BSQL	0.64 J C-BSQL				
delta-BHC	ND	-----	2.3 U	2.4 U				
Dieldrin	ND	-----	4.4 U	4.7 U				
Endosulfan I	ND	-----	2.3 U	2.4 U				
Endosulfan II	ND	-----	4.4 U	4.7 U				
Endosulfan sulfate	ND	-----	4.4 U	4.7 U				
Endrin	ND	-----	4.4 U	4.7 U				
Endrin aldehyde	ND	-----	4.4 U	4.7 U				
Endrin ketone	ND	-----	4.4 U	4.7 U				
gamma-BHC (lindane)	ND	-----	2.3 U	2.4 U				
gamma-Chlordane	0.34	1.02	1.1 J C-BSQL	2.4 U				
[illegible]achlor	ND	-----	2.3 U	2.4 U				
Heptachlor epoxide	ND	-----	0.26 J C-BSQL	2.4 U				
Methoxychlor	ND	-----	23 U	24 U				
Toxaphene	ND	-----	230 U	240 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Aroclor-1016	ND	-----	44 U	47 U				
Aroclor-1221	ND	-----	89 U	96 U				
Aroclor-1232	ND	-----	44 U	47 U				
Aroclor-1242	ND	-----	44 U	47 U				
Aroclor-1248	ND	-----	44 U	47 U				
Aroclor-1254	ND	-----	44 U	47 U				
Aroclor-1260	ND	-----	44 U	47 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 MFDP02 08/22/94	SS003 SS003 MFDP03 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
ALUMINUM	9330	27990	8660	11500				
ANTIMONY	8.1	24.3	7.5 UJ	7.8 UJ				
ARSENIC	7.7	23.1	29.7 J+	20.7 J+				
BARIUM	4920	14760	18900	14700				
BERYLLIUM	0.7	2.1	0.59	0.86				
CADMIUM	ND	----	2.6	1.5				
CALCIUM	17300	51900	11100	9230				
CHROMIUM	18.5	55.5	87.1	90.2				
COBALT	9.1	27.3	12.3	12				
COPPER	32.8	98.4	63.8 J	46.9 J				
CYANIDE	ND	-----	0.66 U	0.69 U				
IRON	16400	49200	18800	22000				
LEAD	117	351	345	174				
MAGNESIUM	4200	12600	3460	4430				
MANGANESE	467	1401	530	410				
MERCURY	ND	----	0.77 J	0.39 J				
NICKEL	27.2	81.6	16.5	19.1				
POTASSIUM	1890	5670	1580	2180				
SELENIUM	0.34	1.02	0.53	0.5				
SILVER	1.9	5.7	2.9	1.8				
SODIUM	164	492	219	490				
THALLIUM	0.53	1.59	0.6 J	0.51				
VANADIUM	23.7	71.1	24.3	29.1				
ZINC	206	618	666	367				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Characterization Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS002 SS002 FDB29 08/22/94	SS003 SS003 FDB30 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
2,4-Dinitrotoluene	ND	—	440 U	470 U				
2,6-Dinitrotoluene	ND	—	440 U	470 U				

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,1,1-Trichloroethane	ND	----	15 U					
1,1,2,2-Tetrachloroethane	ND	----	15 U					
1,1,2-Trichloroethane	ND	----	15 U					
1,1-Dichloroethane	ND	----	15 U					
1,1-Dichloroethene	ND	----	15 U					
1,2-Dichloroethane	ND	----	15 U					
1,2-Dichloroethene (total)	ND	----	15 U					
1,2-Dichloropropane	ND	----	15 U					
2-Butanone	ND	----	15 U					
2-Hexanone	ND	----	15 U					
4-Methyl-2-pentanone	ND	----	15 U					
Acetone	ND	----	15 U					
Benzene	ND	----	15 U					
Bromodichloromethane	ND	----	15 U					
Bromoform	ND	----	15 U					
Bromomethane	ND	----	15 U					
Carbon disulfide	ND	----	15 U					
Carbon tetrachloride	ND	----	15 U					
Chlorobenzene	ND	----	15 U					
Chloroethane	ND	----	15 U					
Chloroform	ND	----	15 U					
Chloromethane	ND	----	15 U					
cis-1,3-Dichloropropene	ND	----	15 U					
Dibromochloromethane	ND	----	15 U					
Ethylbenzene	ND	----	15 U					
Methylene Chloride	ND	----	15 U					
Styrene	ND	----	15 U					
Tetrachloroethene	ND	----	15 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100043

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Background Sampling Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Toluene	ND	-----	15 U					
trans-1,3-Dichloropropene	ND	-----	15 U					
Trichloroethene	ND	-----	15 U					
Vinyl Chloride	ND	-----	15 U					
Xylenes (total)	ND	-----	15 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100044

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Pesticides Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
4,4'-DDD	ND	-----	4.9 U					
4,4'-DDE	ND	-----	4.9 U					
4,4'-DDT	ND	-----	4.9 U					
Aldrin	ND	-----	2.5 U					
alpha-BHC	ND	-----	2.5 U					
alpha-Chlordane	0.35	1.05	0.35 J					
beta-BHC	ND	-----	2.5 U					
delta-BHC	ND	-----	2.5 U					
Dieldrin	ND	-----	4.9 U					
Endosulfan I	ND	-----	2.5 U					
Endosulfan II	ND	-----	4.9 U					
Endosulfan sulfate	ND	-----	4.9 U					
Endrin	ND	-----	4.9 U					
Endrin aldehyde	ND	-----	4.9 U					
Endrin ketone	ND	-----	4.9 U					
gamma-BHC (lindane)	ND	-----	2.5 U					
gamma-Chlordane	0.34	1.02	0.34 J					
Heptachlor	ND	-----	0.14 J					
Heptachlor epoxide	ND	-----	2.5 U					
Methoxychlor	ND	-----	25 U					
Toxaphene	ND	-----	250 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100045

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Polychorinated Biphenyls Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Aroclor-1016	ND	-----	49 U					
Aroclor-1221	ND	-----	100 U					
Aroclor-1232	ND	-----	49 U					
Aroclor-1242	ND	-----	49 U					
Aroclor-1248	ND	-----	49 U					
Aroclor-1254	ND	-----	49 U					
Aroclor-1260	ND	-----	49 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100046

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
1,2,4-Trichlorobenzene	ND	-----	490 U					
1,2-Dichlorobenzene	ND	-----	490 U					
1,3-Dichlorobenzene	ND	-----	490 U					
1,4-Dichlorobenzene	ND	-----	490 U					
2,2'-Oxybis(1-chloropropane)	ND	-----	490 U					
2,4,5-Trichlorophenol	ND	-----	1200 U					
2,4,6-Trichlorophenol	ND	-----	490 U					
2,4-Dichlorophenol	ND	-----	490 U					
2,4-Dimethylphenol	ND	-----	490 U					
2,4-Dinitrophenol	ND	-----	1200 U					
2-Chloronaphthalene	ND	-----	490 U					
2-Chlorophenol	ND	-----	490 U					
2-Methylnaphthalene	ND	-----	490 U					
2-Methylphenol	ND	-----	490 U					
2-Nitroaniline	ND	-----	1200 U					
2-Nitrophenol	ND	-----	490 U					
3,3'-Dichlorobenzidine	ND	-----	490 U					
3-Nitroaniline	ND	-----	1200 U					
4,6-Dinitro-2-methylphenol	ND	-----	1200 U					
4-Bromophenyl-phenylether	ND	-----	490 U					
4-Chloro-3-methylphenol	ND	-----	490 U					
4-Chloroaniline	ND	-----	490 U					
4-Chlorophenyl-phenylether	ND	-----	490 U					
4-Methylphenol	ND	-----	490 U					
4-Nitroaniline	ND	-----	1200 U					
4-Nitrophenol	ND	-----	1200 U					
Acenaphthene	ND	-----	490 U					
Acenaphthylene	ND	-----	490 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100047

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Anthracene	ND	-----	490 U					
Benzo(a)anthracene	33	99	33 J					
Benzo(a)pyrene	ND	-----	490 U					
Benzo(b)fluoranthene	53	159	53 J					
Benzo(g,h,i)perylene	ND	-----	490 U					
Benzo(k)fluoranthene	ND	-----	490 U					
bis(2-Chloroethoxy)methane	ND	-----	490 U					
bis(2-Chloroethyl)ether	ND	-----	490 U					
bis(2-Ethylhexyl)phthalate	130	390	130 J					
Butylbenzylphthalate	ND	-----	490 U					
Carbazole	ND	-----	490 U					
Chrysene	83	249	83 J					
Di-n-butylphthalate	ND	-----	490 U					
Di-n-octylphthalate	ND	-----	490 U					
Dibenz(a,h)anthracene	ND	-----	490 U					
Dibenzofuran	ND	-----	490 U					
Diethylphthalate	ND	-----	490 U					
Dimethylphthalate	ND	-----	490 U					
Fluoranthene	68	204	68 J					
Fluorene	ND	-----	490 U					
Hexachlorobenzene	ND	-----	490 U					
Hexachlorobutadiene	ND	-----	490 U					
Hexachlorocyclopentadiene	ND	-----	490 U					
Hexachloroethane	ND	-----	490 U					
Indeno(1,2,3-cd)pyrene	ND	-----	490 U					
Isophorone	ND	-----	490 U					
N-Nitroso-di-n-propylamine	ND	-----	490 U					
N-Nitrosodiphenylamine	ND	-----	490 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100048

(Continued)

Delta Shipyard (CERCLIS ID LAD058475419)

Soil Background Sampling Semi-Volatile Organics Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
Naphthalene	ND	-----	490 U					
Nitrobenzene	ND	-----	490 U					
Pentachlorophenol	ND	-----	1200 U					
Phenanthrene	32	96	32 J					
Phenol	ND	-----	490 U					
Pyrene	52	156	52 J					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100049

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Metals Results (mg/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 MFDP01 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
ALUMINUM	9330	27990	9330					
ANTIMONY	8.1	24.3	8.1 J					
ARSENIC	7.7	23.1	7.7 Jv					
BARIUM	4920	14760	4920					
BERYLLIUM	0.7	2.1	0.7					
CADMIUM	ND	----	1.1 U					
CALCIUM	17300	51900	17300					
CHROMIUM	18.5	55.5	18.5					
COBALT	9.1	27.3	9.1 Jv					
COPPER	32.8	98.4	32.8 J					
CYANIDE	ND	----	0.71 U					
IRON	16400	49200	16400					
LEAD	117	351	117					
MAGNESIUM	4200	12600	4200					
MANGANESE	467	1401	467					
MERCURY	ND	----	0.14 UJ					
NICKEL	27.2	81.6	27.2					
POTASSIUM	1890	5670	1890					
SELENIUM	0.34	1.02	0.34					
SILVER	1.9	5.7	1.9					
SODIUM	164	492	164					
THALLIUM	0.53	1.59	0.53					
VANADIUM	23.7	71.1	23.7					
ZINC	206	618	206					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100050

Delta Shipyard (CERCLIS ID LAD058475419)
Soil Background Sampling Explosives Results (ug/kg)

Analyte	Maximum Background	3 Times Maximum Background	SS001 SS001 FDB27 08/22/94	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose	Left Blank On Purpose
2,4-Dinitrotoluene	ND	---	490 U					
2,6-Dinitrotoluene	ND	---	490 U					

Shaded Values Exceed 3 Times Maximum Background Value for Constituents Attributable to the Site.

1100051

REFERENCE 13

GROUND WATER
IN
LOUISIANA

WATER RESOURCES BULLETIN No. 1

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and
LOUISIANA DEPARTMENT OF PUBLIC WORKS
Baton Rouge, La.
August 1960

the alluvium on the fringes of the valley. The sharp decrease in the depth of fresh water occurrence (pl. 3) marks the southern limit of flushing by fresh water in Pliocene deposits.

Yields of wells in the deposits of Pliocene age generally are less than those from the overlying Quaternary deposits. The largest known yield from Pliocene deposits in area 1 is about 1,000 gpm from a well at Oakdale, in Allen Parish. Only a few wells have been completed in strata of Pliocene age in area 1 mainly because of the availability of large quantities of water from the overlying Quaternary deposits. The primary reason for the development of this aquifer is to obtain water of a better quality than that from the overlying Quaternary deposits. Two analyses of water from the Pliocene in area 1 are included in table 7. These analyses indicate that the water is of the soft sodium bicarbonate type, but, both samples were greatly discolored, probably due to organic matter, and had a somewhat high total iron content. In addition, water from well Ev-142 contains fluoride in a concentration high enough to cause severe mottling of the teeth of children.

In area 2 many wells are completed in Pliocene deposits to take advantage of the good quality of water and high artesian head. Flowing wells are common throughout this area except in the Baton Rouge area where large withdrawals of water for municipal and industrial supplies have lowered the piezometric surface. The largest yield from the Pliocene sediments in area 2 is a natural flow of about 3,200 gpm from a municipal-supply well at Slidell.

Analyses of water from four wells in area 2 are listed in table 7. These analyses indicate that the water typically is the soft, sodium bicarbonate type. Other chemical constituents vary in concentration areally and with depth. Shallower wells generally yield acid-tending waters with lower dissolved-solids content and greater quantities of iron than water from the deeper wells. Three of the samples of water from area 2 were slightly discolored. This color would not be readily apparent, but one well (SL-166)

yields water which has a color higher than the limit of 20 set by the U.S. Public Health Service.

QUATERNARY SYSTEM

The Quaternary deposits of Louisiana are composed of sediments of Pleistocene and Recent age. The Pleistocene deposits are of two general types; an approximately coastwise, gulfward-thickening wedge of deltaic sediments and the relatively thin, veneerlike deposits which form the stream terraces and alluvial valley fills. The deposits of Recent age form a thin mantle of sand, silt, and clay restricted to stream valleys and coastal areas. The Recent deposits generally are thin and not important as aquifers; therefore, they are not differentiated from the deposits of Pleistocene age on plate 2. The deposits of Pleistocene age that have been divided into formations by Fisk (1938, 1940, and 1944) and Jones (1954) comprise several hydrologic units which do not coincide with the formations.

It is difficult to differentiate between the coastwise Quaternary deposits and the underlying Pliocene deposits in those areas where the basal Quaternary deposits are not gravelly. The lack of distinctive lithologic units at the contact of Pliocene and Quaternary deposits is illustrated by the composite electrical log of the Miocene, Pliocene, and Quaternary deposits (fig. 13). Thus, correlations must be considered approximate because of the lithologic similarity of the two deposits. The Quaternary deposits throughout the State are composed of gravel, sand, silt, and clay and range in thickness from less than 50 feet in central and northern Louisiana to more than 3,500 feet near the coast. They are shown as one unit on the fence diagram (pl. 2).

The Quaternary deposits, which blanket most of Louisiana (pl. 1 and fig. 16), yield about two-thirds of all the ground water pumped in the State. To describe the availability of fresh water the Quaternary deposits have been divided into upland and valley deposits. The relatively thin Quaternary valley deposits fill the major stream valleys and blanket the coastal areas. The Quaternary upland deposits also consist of two major groups—the rela-

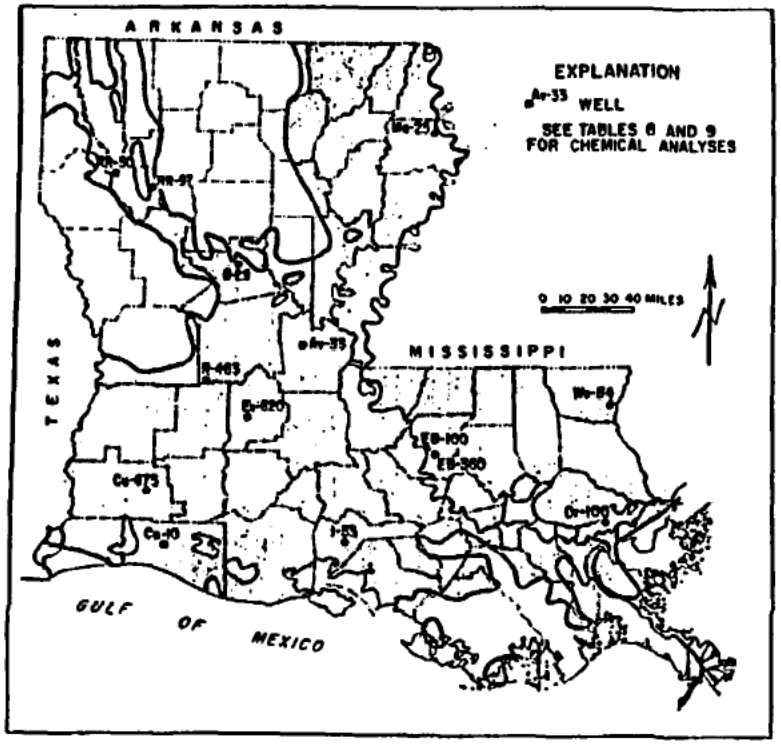


Figure 16. Map showing the approximate area where rocks of the Quaternary system contain fresh water.

tively thin terraced deposits which flank the stream valleys of northern Louisiana and the coastwise terraced deposits which dip and thicken toward the coast. (See pl. 2.)

Quaternary Valley Deposits

The Quaternary valley deposits are recharged mainly from rainfall. The streams that flow across these deposits normally are effluent during most of the year, and groundwater discharge contributes significantly to the base flow of these streams. The hydraulic gradient near the streams is reversed during high-water stages, and the streams become influent for brief periods. However, on a yearly basis the discharge into streams exceeds the recharge from them. The valley deposits are recharged to a small extent from upward movement of water from underlying aquifers of Tertiary age and from lateral movement from adjacent

Quaternary upland deposits. Movement of ground water in the valley deposits is generally toward the major streams and downstream, because of the gradient imposed by topography.

The occurrence of fresh ground water is irregular in the lower Mississippi River valley. (See fig. 16—east of well I-53 and south of well Or-100.) The occurrence of fresh ground water in this area may be related to the positions of ancestral channels of the Mississippi River.

Valley deposits throughout much of the State are composed of sand and gravel near the base and become progressively finer grained toward the top. The basal sand and gravel is a prolific source of water and wells in deposits yield as much as 4,000 gpm.

Analyses of water from five wells completed in Quaternary valley deposits are given in table 8. These analyses show that the water generally is very hard and has a high total iron content. The hardness ranges from 228 ppm to 480 ppm. All the analyses listed in table 8 show a total iron content in excess of the U.S. Public Health Service's recommended limit of 0.3 ppm. However, the potentially high yields of wells in these deposits and the relatively low water temperature make these deposits an excellent source of water for irrigation and some industrial purposes.

Quaternary Upland Deposits

Terraced Deposits of Northern Louisiana

The terraced deposits which flank the stream va and cap the older formations in northern Louisiana are recharged by local rainfall. Ground water in these deposits generally is under water-table conditions and moves from topographically high positions to local stream valleys.

The terraced deposits generally are composed of a sedimentary sequence which ranges in grain size from coarse at the base to fine at the top, much like the deposits in the valley areas. The lower part of the section in many areas contains gravel, but the yields of wells completed in these deposits, generally are small because of the relatively thin saturated thickness of the deposits.

The analyses of water from two wells (G-29 and RR-97) completed in these deposits are given in table 9, and the locations of the wells are shown on figure 16. Water from these deposits has a very low dissolved-solids content and is soft. Excessive total iron concentrations (greater than 0.3 ppm) would require some treatment to make the water completely suitable for domestic use.

COASTWISE TERRACES AND THEIR SUBSURFACE EQUIVALENTS

The terraced deposits of northern Louisiana coalesce with their coastwise equivalent in the southern third of the State. The coastwise deposits gradually dip and thicken gulfward. These sediments have been named the Chicot reservoir in southwestern Louisiana (Jones, 1954, p. 138). The equivalent but finer textured sequence in southeastern Louisiana is unnamed.

The deposits are recharged mainly by rainfall in the outcrop areas throughout southern Louisiana. In southwestern Louisiana, because of heavy withdrawals there are several additional sources of recharge. These sources of recharge are from water moving through the confining beds (Jones, 1954, p. 170-172) and perennially or periodically from streams that incise the aquifers. Such recharge is undesirable where the water in the streams is salty, such as in the lower Vermilion River (Jones, 1954, p. 164-170). The hydraulic gradient in southwestern Louisiana in the recent past has been toward the Gulf of Mexico; however, heavy withdrawals for irrigation and industry have reversed the gradient along the coast and caused saline waters to move slowly northward. This movement is discussed by Jones (1954, p. 223-225), Fader (1957, p. 21), and Harder (1957, p. 158-160).

The coastal terrace deposits in southeastern Louisiana are a part of a larger hydraulic system. The distribution of head with depth in aquifers in the northern part of the area indicates that water from precipitation enters the terraced deposits, either in the outcrop area or through beds that are only partly confining, and migrates downward through the deposits and into the underlying aquifers. The land surface is underlain by clay in the southern part of

the area; however, some water from precipitation may migrate through this confining bed into the coastal terraced deposits. Deeper aquifers, which contain water under greater hydrostatic head, probably are additional sources of recharge.

Yields of wells completed in these deposits generally are large. The largest yield is about 6,000 gpm from a well for rice irrigation in southwestern Louisiana, where the average yield of irrigation wells is about 1,800 gpm. The potential yield of wells is less in the outcrop area because of the thinning of the aquifer.

The dissolved-solids content of the water is low in the outcrop areas of the coastal terraced deposits, as typified by the analysis of water from well R-463 (table 9). Mineralization of ground water increases downdip, as indicated by a comparison of the analyses of water from wells R-463 and Wa-54 with those of water from wells in the central and southern parts of the coastal area. (See table 9 and fig. 16.) The deposits in a large part of southwestern Louisiana and the northern part of southeastern Louisiana generally contain water having an objectionable quantity of iron. Wells R-463 and Wa-54, near the outcrop area, yield water having a relatively low pH and a high iron content. The water generally is soft in southeastern Louisiana; however, the water in southwestern Louisiana may increase in hardness as it moves downdip.

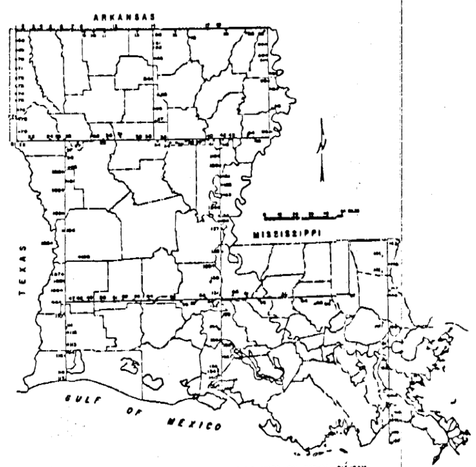
FENCE DIAGRAM
SHOWING
SUBSURFACE GEOLOGY
OF
LOUISIANA

EXPLANATION

Recent Pleistocene		Qp	QUATERNARY	
Pliocene		Tp		
Miocene		Tm		
Oligocene	Vicksburg	Tv		
	Jackson			
Eocene	Claiborne	Cockfield Tcm	TERTIARY	
		Cook Mountain		
		Sparta Tcr		
		Cane River		
Eocene-Paleocene	Wilcox	Tw		
Paleocene	Midway	Tmy		
Undifferentiated		K	CRETACEOUS	

Maximum depth to which fresh ground water occurs, intermediate sands may contain salt water

WEEKS ISLAND SALT DOME



INDEX MAP SHOWING LOCATIONS OF WELLS USED ON FENCE DIAGRAM
(SEE TABLE 10 FOR DESCRIPTIONS OF WELLS)

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